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ABSTRACT

The primary purpose of this module is to develop preservice student ability to write precise behavioral objectives and to match the thinking level of behavioral objectives with the kinds of thinking expected of elementary pupils exposed to teaching based on those behavioral objectives. The student will also be taught to compose teacher questions that reflect the level of thinking desired of pupils and that clearly define for the pupils the "thinking" behavior(s) they are able to exhibit. The first part of this module outlines information and activities designed to develop critical thinking competencies embodied in the listed behavioral objectives. The second part offers information and activities dealing with classifying and writing instructional cognitive objectives focusing on the thinking process. Classifications of thinking as categorized by Bloom and his associates place knowledge at the base of a pyramid representing the least complex behavior, then comprehension, application, analysis, synthesis, and evaluation in an ascending order. Principles, descriptions, sample behavioral objectives, and activities for the six categories of Bloom are provided. Related documents are SO 005 443 through SO 005 448, and SO 005 450. (Author/SJM)

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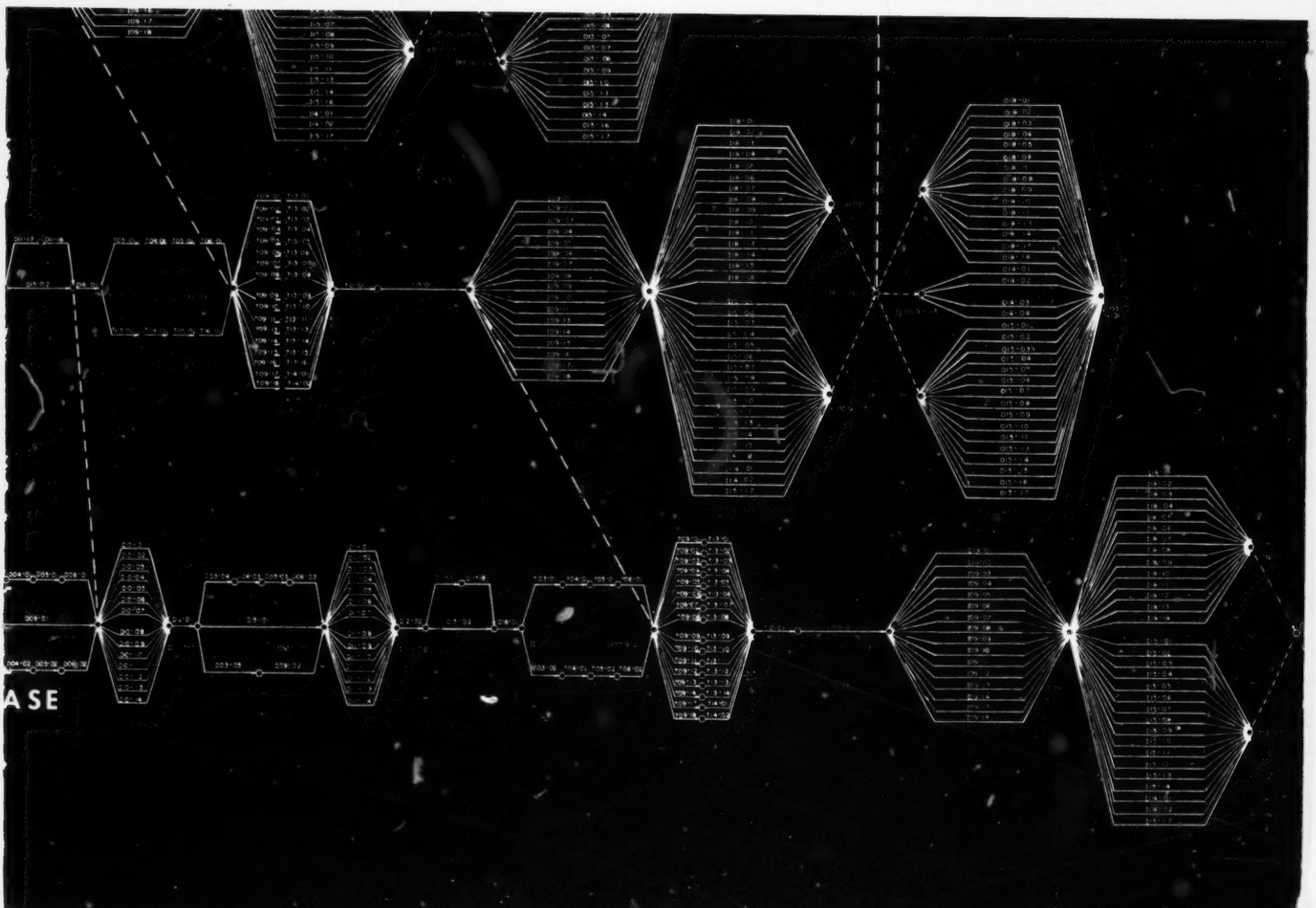

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HARMONIZING QUESTIONS AND ACTIVITIES USED BY TEACHERS WITH THE LEVEL OF COGNITIVE BEHAVIOR EXPECTED OF PUPILS

SOCIAL STUDIES FOR THE ELEMENTARY SCHOOL

PROFICIENCY MODULE #2

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INTRODUCTION

In 1961 the Educational Policies Commission issued a statement entitled, The Central Purpose of American Education. The most well-known sentence of this document stated, "The purpose which runs through and strengthens all other educational purposes--the common thread of education--is the development of the ability to think" (emphasis mine). Up to that point in time most objectives for social studies were either strongly content-oriented, e.g., knows the seven continents (place-name geography) or based largely on predetermined products, e.g., good citizenship, deemed as desirable results of formal education. The most important outcome of the Educational Policies Commission's report was that educators, who by and large agreed with the statement, began to take increased interest in thinking and, as a result, often turned their attention to the development of more process-oriented curriculum.

If we assume that development of the ability to think (the thinking processes) is the most significant purpose of education, how can one evaluate whether that purpose or goal is being considered in instructional situations? In teaching, purposes and goals are best reflected by the objectives set for learners. One way of determining the relative importance a teacher gives

to the development of thinking abilities is to examine critically their objectives. Using this tactic we are, of course, assuming that one's objectives do reflect his purposes and goals.

As we examine a teacher's objectives in order to make inferences about the purposes and goals he holds highest for the social studies, what questions might we ask?

1. Are the objectives clear enough to be understood by others?
2. Are the objectives precise enough to convey to pupils (through activities and questions employed by the teacher) the kind(s) of thinking expected of them?
3. Can pupil attainment of the objectives be measured, that is, do the objectives clearly state or strongly imply how pupils will be evaluated?

The primary purpose of this module is to develop students' ability to write precise behaviorial objectives and to match the thinking level of behavioral objectives with the kinds of thinking expected of pupils exposed to teaching based on those behavioral objectives. The student will also be taught to compose teacher questions that reflect the level of thinking desired of pupils and that clearly define for the pupils the "thinking" behavior(s) they are to exhibit.

BEHAVIORAL OBJECTIVES

The sequences of information and activities of this module are designed to develop those competencies embodied in the following behavioral objectives:

I. Terminal Competencies

1. Given a selection of information to serve as the basis of a lesson, the student will be able to:
   A. Write precise behavioral objectives for the lesson that reflect at least four levels of Bloom's Taxonomy.
   B. Write a pivotal question for each behavioral objective that clearly tells pupils what kind(s) of thinking is expected of them.

2. Using an audio tape of a lesson the student has actually taught to children, he will be able to:
   A. Classify the cognitive (thinking) level of all questions asked to children by the teacher during the lesson.
   B. Draw conclusions concerning his teaching from the findings derived from that classification. (While skills needed to complete this objective are developed in this module, the competency will be evaluated in the module on evaluation.)

II. Enabling Activities

1. Given a list of partial objectives, the student will be able to select those partial objectives having action verbs denoting observable pupil behavior.
2. Given several instructional objectives that are stated in performance (behavioral) and non-performance form; the student will be able to identify those objectives stated in performance terms. The student will also be able to rewrite the non-performance objectives in performance form.
3. Given many instructional objectives stated in performance terms, the student will be able to classify the objectives at various levels of Bloom's Taxonomy.
4. Given selections of content, the student will be able to write instructional objectives in behavioral form at each level of Bloom's Taxonomy.
5. Given instructional objectives written in behavioral form at different levels of Bloom's Taxonomy, the student will be able to write a question for each objective that clearly conveys to pupils the thinking behavior they are to use in correctly answering each question.

PART I. BEHAVIORAL OBJECTIVES

Upon termination of Part I of this module you should be able to successfully complete the following behavioral objectives:

1. Given a list of partial objectives, the student will be able to select those partial objectives having action verbs denoting observable pupil behavior.
2. Given several instructional objectives that are stated in performance (behavioral) and non-performance form, the student will be able to identify those objectives stated in performance terms. The student will also be able to rewrite the non-performance objectives in performance form.

In the last decade of changes in social studies education there has been a strong movement toward the specification of instructional objectives in clearer, more precise terms. This trend is based on the assumption that the clearer and more precise the

teacher's instructional objectives, the more effective will be the instruction and the higher the chances that pupil learning will take place.[1] What is meant by clearer, more precise instructional objectives? In general the basic idea has been to specify objectives in terms of students' performance or behavior that can be observed, measured and evaluated. Thus these "new-order" objectives have been named behavioral or performance objectives.

Each of us has probably been a member of at least one class or course in which we were quite unsure as to what was expected of us--what the teacher expected us to learn or to be able to do upon completion of the course. In such a situation you may have been forced to try "psyching out the teacher." Behavioral objectives represent a means whereby a teacher can add clarity and focus to a course by designating to students the specific behaviors or performances expected of them.

[1]Ambrose A. Clegg, Jr. "Developing and Using Behavioral Objectives in Geography," in Focus on Geography: Key Concepts and Teaching Strategies, 40th Yearbook of the National Council for the Social Studies, Washington, D.C., 1970, p. 291.

Elements of a Behavioral Objective

Behavioral objectives contain the following elements:

1. The person who is to perform the particular learning behavior (e.g., the student, the learner, the class, a small group, a committee).
2. The specific behavior required to demonstrate accomplishment of the objective (e.g., to write, to name, to construct, to locate).
3. The learning outcome or product by which the accomplishment of the objective can be evaluated (e.g., a statement of fact or a generalization, a contour map, a simple grid system).
4. The conditions under which the behavior is to be performed (e.g., with the aid of an atlas, using data from the 1970 census).

5. The criterion or standard used to evaluate the accomplishment of the performance (e.g., correct to the nearest mile, four out of five correct).[2]

Element #1 is self explanatory. In the social studies, we hope that elementary children would have opportunities to interact in different sizes of learning groups.

Element #2, the specific behavior required to demonstrate accomplishment of the objective, is perhaps the most important of all the elements. This part of the behavioral objective is commonly named "the behavioral term." The behavioral term should state what the student <u>does</u> when he exhibits achievement of a particular objective. The behavioral term should meet the following three criteria:

1. a strong <u>action</u> verb that precisely identifies the pupil's expected behavior.
2. easily <u>observable</u>. That is, one should be able to <u>see</u> the behavior when it is demonstrated. This requirement comes from the idea that if you cannot actually

[2]Ibid., p. 292.

see a behavior being demonstrated, you have no proof that the behavior was demonstrated. This does not mean that you "see" a behavior only with the eyes, e.g. you could hear someone make a verbal statement required by an objective.

3. stated in such a way that there is no confusion as to the intended outcome of the objective. This is to say that along with being able to see the behavior we also know what the initial result of the behavior will be. For example, suppose we want the students to list the seven continents of the world. "To list" would then be the behavioral term of the objective. Would you be able to observe or see a student list seven continents? Likely so. What is intended as the outcome of the objective? A list or listing (on the blackboard, a sheet of paper, etc.). Would you be confused as to whether a

listing had been produced? Probably not, for you know what a listing of items would look like.

Now turn to Activity 1 on the following page. Determine if the twenty behavioral terms presented meet each of the three above criteria. The first behavioral term has been completed for you as an example.

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Activity 1

Do the following behavioral terms meet the criteria presented above? Write yes or no in each of the columns.

	Behavioral term action verb	Readily observable	Certainty about initial outcome
1. to outline	Yes	Yes	Yes
2. to be sensitive			
3. to compare			
4. to have ability to			
5. to label			
6. to rewrite			
7. to realize			
8. to list			
9. to know			
10. to understand			
11. to identify			
12. to believe in			
13. to verbally defend			
14. to appreciate			
15. to recognize importance of			
16. to predict			
17. to interpret a symbol			
18. to be committed			
19. to diagram			
20. to construct			

Element #3 has been partially explained under the discussion of element #2. The learning outcome represents that product that occurs as a result of student demonstration of the expected behavior. For example, if the behavioral term is "to construct," then we know that the outcome or product of the pupil behavior will be some form of a construction (perhaps a model) prepared by the pupil. Sometimes the introductory stem, "As a result of this lesson the student will be able to ..." is used when writing a behavioral objective to point out the intended outcome.

Element #4 represents those experiences, materials, etc. that the pupil was exposed to during the evaluation process (when the pupil shows he can demonstrate the behavior). The conditions under which the behavior is to be performed identifies what the student must be given or what the student has previously been provided (be it materials or information) that will enable him to accomplish the objective. For example, consider this objective: "Given a list of the states of the Southeast and a list of capital cities of those states, the pupil will match the states with their respective capitals."

The two lists given the pupil are the conditions under which the behavior will occur in this objective.

The last element specifies the criterion of acceptable performance. It tells the teacher how well the child was able to perform. It can be stated as a time limit (within fifteen minutes), the number of correct answers expected (nine out of ten), a percentage (90% of the students score 80% or better), or a degree of accuracy (correct to the nearest million), depending on the most appropriate means of measurement selected by the teacher for a specific behavioral objective. Sometimes the criteria of acceptable performance may be a "can do-can't do" decision. Within the "can do" there might be various levels of proficiency, but basically the teacher only wants to be sure the pupil can do the task. This is the criterion level of the behavioral objectives written in each of the nine modules you will complete. It is desired that each person "can do" certain tasks. Recognizing individual differences, the writer knows that different people "can do" and will

do various levels of proficiency. The important consideration is that each person "can do" each objective--that he or she has a basic level of proficiency. Different instructors utilizing the modules may wish to employ certain levels of proficiency as a means of evaluation, but the original intent of thses modules was to determine whether or not participants, following instruction, could exhibit certain minimal behaviors or skills.

Then, too, stating a criterion level of performance raises problems if the behavioral objective is written as an objective for a class. We know that any classroom or any group of individuals, has various levels of ability within it. Then the question is whether a criterion level should be set and each person be expected to meet that level regardless of his ability. If your answer is no, then you are led to the other extreme of writing a different criterion level for each person or each ability level in the classroom. Given the many responsibilities of an elementary teacher, it is doubtful that this could or should be expected.

But this discussion does raise the point that behavioral objectives can be used to individualize instruction. Not only can different criterion levels of performance be used to individualize instruction, but different behaviors or behavioral terms (some students may be expected to display more complex behaviors than others) and different conditions (various levels of difficulty of materials to be used) also can be used to individualize instruction.

Up to this point it has been demonstrated that the use of behavioral objectives can help a teacher add clarity to his teaching (and to pupils' learning) and can be used in individualizing instruction. Some other advantages of using behavioral objectives are:

1. Behavioral objectives give both teachers and pupils a clear sense of purpose.
2. Behavioral objectives facilitate the fragmenting of content into meaningful and manageable pieces.
3. Behavioral objectives facilitate the organizing of content into hierarchies and therefore instructional sequence.

4. Behavioral objectives simplify evaluative procedures.
5. Behavioral objectives simplify the training of teachers.
6. Behavioral objectives clarify the relevance of particular pieces of instructional material.
7. Behavioral objectives open the educative process to research and planning.[3]

As a review of the elements of a behavioral objective, see if you can identify each element (all elements are present) in the example given below.

Given pictures of various people at work in a community, the pupil will be able to differentiate between pictures illustrating workers producing goods and workers producing services by placing every picture in the correct category.

Criteria

1. Person to perform--
2. Specific behavior required--
3. Learning outcome--
4. Conditions--
5. Criterion or standard of evaluation--

Turn to the top of the next page to check your answer.

Martin Haberman, "Behavioral Objectives: Bandwagon or Breakthrough?" The Journal of Teacher Education, 19:91-95, Spring, 1968.

1. Person--the (each) pupil
2. Specific behavior required--Differentiate by placing in correct category.
3. Learning outcome--two categories with correct pictures under each (categories could be written on two sides of the blackboard).
4. Conditions--Pupil was given a number of pictures of community workers.
5. Criteria--objective states, "every picture in the correct category."

Activity 2

Listed on the next page are several instructional objectives. Decide whether or not each objective is written in behavioral (performance) terms as specified by the five elements of a behavioral objective explained previously. Rewrite those objectives written in non-behavioral terms in such a way as to convert them to behavioral objectives. The first example is completed for you.

Activity 2

Objective	Behavioral Objective (Yes or No)	Element(s) Missing or Incorrect	Rewritten Objective (if answer in first column was "no")
1. Given paper and pencil, the pupil should know the causes of the Civil War.	No	Poor Behavioral term - No criteria - Outcome is vague	Given paper and pencil each pupil will list at least two causes of the Civil War.
2. After studying a picture of a dining room in a Japanese home the class will list at least three features of the room that are different from what would be found in a typical American dining room.			
3. The pupil will label the height (in feet from sea level) of five different geographic points.			
4. Given a picture showing the first fences built on previously unfenced land in the Great Plains, what changes would occur for the settlers?			

Activity 2, , continued...

Objective	Behavioral Objective (Yes or No)	Element(s) Missing or Incorrect	Rewritten Objective (if answer in first column was "no")
5. Using information seen and heard from watching the film "Conservation of Natural Resources," the pupil will explain in his own words one reason for conserving petroleum.			
6. After studying about division of labor, the class will apply their learning of the idea by participating in an activity requiring them to use the idea to produce a product.			

PART II. BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES

Upon completion of Part II the reader will have gained the competencies needed to successfully complete behavioral objectives numbers three and four from the enabling activities listed on page 4. These objectives are:

> Given many instructional objectives stated in performance terms, the student will be able to classify the objectives at various levels of Bloom's Taxonomy.
>
> Given selections of content, the student will be able to write instructional objectives in behavioral form at each level of Bloom's Taxonomy.

Think back to your years as a student in the elementary grades. Can you remember any teachers who seemed to emphasize the learning of dates, names of people and events, and places in your country and other countries of the world in their social studies classes? Did you learn these items or facts by rote; that is, by memorization? Unfortunately, despite what is now known concerning the poor retention rate of much learning done on a rote or memorization basis, many of today's teachers still strongly emphasize factual or knowledge objectives in their instruction.

We would all agree that social studies instruction for young children should include much more than the learning of facts and knowledge. But, then too, we all know that in order to utilize thought processes that require more than memory a person needs a certain amount of background information to use in carrying out higher level thought processes. For example, before we can compare the elevations of Denver, Colorado and Detroit, Michigan, using a physical feature map, we need to know what elevations the different colors and color shadings of the map represent. In short this is saying that the teaching of information and facts is not something that should be avoided, but rather something that should be seen in a different perspective. And that perspective might be stated as, "Knowledge for what?"

What is the role of knowledge in the learning process? What other thinking processes other than memorizing should pupils be required to utilize?

In 1948 a group of college examiners conceived the idea of developing a system for classifying educational objectives. Their primary focus was a consideration of the different kinds of objectives, as reflected by testing items, of teachers, and the level of cognitive (thinking) behavior expected of pupils to achieve those objectives.

From their thinking came a classification system, commonly called a taxonomy, of the cognitive domain. The material in this part of the module is based on ideas presented in the

book, Taxonomy of Educational Objectives-Handbook 1: Cognitive Domain, prepared by the college examiners. This taxonomy is often referred to as Bloom's Taxonomy because Bloom was the editor of the above named book.

Bloom and the other authors of the Taxonomy divided thinking into two levels: (1) Knowledge, and (2) Intellectual Abilities and Skills. Knowledge is little more than the remembering of an idea or phenomena in a form very close to that in which it was first experienced. Thinking abilities and skills represent those kinds of thinking that require the use of certain methods of operation or techniques and certain information (knowledge) to solve a problem. Bloom states, "In solving problems requiring intellectual abilities, the student is expected to organize or reorganize a problem, to recognize what material is appropriate, to remember such material, and to make use of it in the problem situation."[1]

Figure 1 on page 23 illustrates the different classifications of thinking as categorized by Bloom and his associates. Knowledge, at the base of the pyramid represents the least complex thinking behavior and evaluation the most complex thinking behavior. Descriptions of each of the six categories of Bloom's Taxonomy

[1]Taxonomy of Educational Objectives-Handbook 1: Cognitive Domain, edited by Benjamin S. Bloom (New York: David McKay Company, Inc., 1956). p. 39.

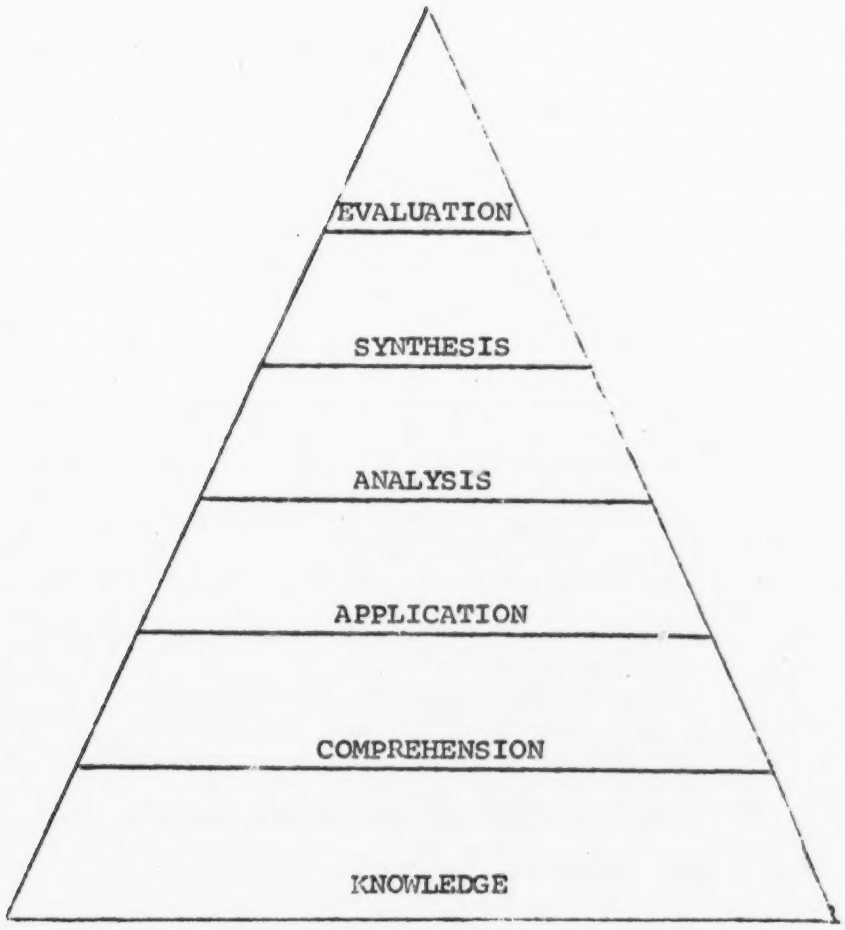


FIGURE I

BLOOM'S TAXONOMY OF

THE COGNITIVE DOMAIN

and sample behavioral objectives for each cateogory will be presented later in this model. Prior to studying these definitions and examples, the reader should understand the following principles on which the Taxonomy is based.

1. The six categories of thinking of the Taxonomy encompass all cognitive objectives in education. Any cognitive objective can be classified into one of the six categories. While two or three people trying to classify a specific objective may not agree on the category of that objective (and each party can make a good case for the category they propose), this represents no detraction from the quality of the objective. The mere fact that the people involved know the format and composition of the Taxonomy represents that they are at least aware of different levels of thinking. Hopefully, they will use that awareness of the Taxonomy in planning classroom learning experiences that provide pupils with opportunities to exhibit the various levels of thinking.

2. The Taxonomy arranges the thinking behavior of objectives in a hierarchical order with each successive category including more complex thinking behavior than the category before it. The categories are sequential and cumulative. This is to say that each category has unique

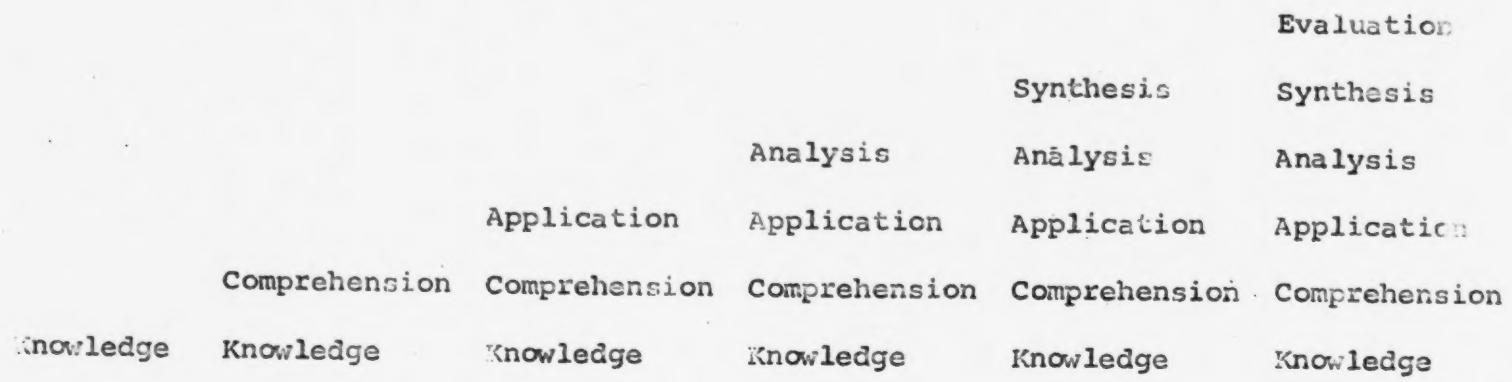
elements but also includes elements of all lower categories. For example, in order to comprehend (comprehension category) the learner must possess certain knowledge. Figure 2 on the next page illustrates how each category includes elements from each category below it.

3. If in classifying any objective, the reader can make a legitimate case for placing the objective in more than one category, a rule of thumb is to classify the objective in the highest of the categories being considered.

4. In categorizing an objective the classifier must consider the previous experiences of the pupil(s) for whom the objective is intended. For example, cursory examination of an objective may lead one to believe that a high level of thinking is required but it may actually require little more than recall (knowledge category) if the pupil has had prior experience with the objective. If you are not given, or do not know, the previous background of experience that pupils have had related to a certain objective, assume that the objective and what it requires is new to the pupils.

FIGURE 2

HIERARCHY OF BLOOM'S TAXONOMY



5. The Taxonomy is best used to classify objectives written in behavioral terms because it is based on the difficulty level of the thinking behavior expected of the learner.
6. In classifying an objective, the choice is made according to the level of thinking the objective is intended to elicit.

The following section presents a description of each category of Bloom's Taxonomy and examples of behavioral objectives written for each category.

Level One - Knowledge

> Knowledge as defined here includes those behaviors and test situations which emphasize the remembering, either by recognition or recall, of ideas, material, or phenomena. The behavior of a student in the recall situation is very similar to the behavior he was expected to have during the original learning situation. In the learning situation the student is expected to store in his mind certain information and the behavior expected later is the remembering of this information.[2]

The knowledge category of objectives is not restricted to the knowledge of facts. As an example, let us take the case of the teacher who expects all her third-grade children to "know" the generalization, "Ways of living are learned." She tells the children that they are to "know" this and asks the children to memorize the statement. Later as she quizzes the children

[2] Ibid., p. 62.

individually, she determines which children have mastered her objective. Although the idea that children were memorizing could have been the basis of several lessons focusing on higher level thinking abilities, in this case, pupils were simply memorizing a statement on which they would later be tested. This represents a knowledge objective--knowledge of a generalization.

Examples of Knowledge Behavioral Objectives:

1. Given paper and pencil, the pupil will be able to list, without references, the five most populous states of the United States in order from most populated to least populated.

2. Without references, the pupil will be able to recite the Pledge of Allegiance with no pronunciation mistakes.

Level Two - Comprehension

> . . .When students are confronted with a communication, they are expected to know what is being communicated and be able to make some use of the materials or ideas contained in it. The communication may be in oral or written form, in verbal or symbolic form, or if we allow a relatively broad use of the term 'comprehension,' it may refer to material in concrete form as well as material embodied on paper. . . .We use the term 'comprehension' to include those objectives, behavior, or responses which represent an understanding of the literal message contained in a communication.[3]

[3]Ibid., p. 89.

Bloom identifies three types of comprehension behavior: translation, interpretation, and extrapolation. Translation means that a pupil puts a communication into other language or into another form of communication. Interpretation involves the explanation or summarization of a communication. It includes thinking about the relative importance of ideas and their interrelationships. Evidence of interpretive behavior may be found in the inferences or generalization a pupil can produce. (You will recall that a generalization may also be a memorized response.) Extrapolation includes the making of estimates or predictions based on conditions in the communication.

Examples of Comprehension Behavioral Objectives:

1. Given a graph showing amount of yearly rainfall in five large United States cities, the pupil will explain to the class the kind of information found in the graph.
2. Given pages 14-16 of the social studies textbook, the pupil will read those pages and state the main idea of the reading selection.

Level Three - Application

The application level of the taxonomy is somewhat similar to the comprehension level but requires one step beyond comprehension. Comprehension implies that a pupil knows something well enough that he can correctly demonstrate its use if called

upon to do so. Application implies that given a problem new to the pupil he will apply previous learnings to the new situation without having to be prompted or without having to be shown how to use the learnings in the new situations. Comprehension is can use behavior, while application is more of a will use behavior.

> The fact that most of what we learn is intended for application to problem situations in real life is indicative of the importance of application objectives in the general curriculum. The effectiveness of a large part of the school program is therefore dependent upon how well the students carry over into situations applications which the students never faced in the learning process. Those of you familiar with educational psychology will quickly recognize this as the age-old problem of transfer of learning. Research studies have shown that comprehending an abstraction does not certify that the individual will be able to apply it correctly. Students apparently also need practice in restructuring and classifying situations so that the correct abstraction applies.[4]

Examples of Application Behavioral Objectives:

1. Having previously studied about the responsibilities of a committee chairman and the members of a committee, pupils will demonstrate understanding of those responsibilities by their behavior when working in committees to prepare group reports on various states of the Northeast.
2. After studying about how various physical features have affected the location of settlements, pupils will be given a physical features map of a

[4] Ibid., p. 122.

hypothetical country and be asked to relate previously learned information by identifying an appropriate geographical point in the country for settlement.

Level Four - Analysis

The thinking process of analysis requires the breakdown of material into its constituent parts. It includes the analysis of elements (e.g. distinguishing between statements of fact and opinion), the analysis of relationships (e.g., determining which data supports a conclusion or generalization and which data does not offer support) and the analysis of principles (e.g., detecting the point of veiw or bias of a writer as a result of reading his works). Analysis objectives are difficult to teach and learn, but competence in analyzing is a very important thinking skill in every field of study, especially the social studies.

> Skill in analysis may be found as an objective of any field of study. It is frequently expressed as one of science, social studies, philosophy, and the arts. They wish, for example, to develop in students the ability to distinguish fact from hypothesis in a communication, to identify conclusions and supporting statements, to distinguish relevant from extraneous material, to note how one idea relates to another, to see what unstated assumptions are involved in what is said, to distinguish dominant from subordinate ideas or themes in poetry or music, to find evidence of the author's techniques and purposes, etc., etc.[5]

[5] Ibid., p. 144.

Examples of Analysis Behavioral Objectives:

1. Given two varying newspaper accounts of the same happening or event, the pupil will be able to identify the biases of the writers. (For example, the two accounts could be about school busing.)
2. Following a fifth-grade unit of instruction on the American government, the pupil will be given a list of statements concerning the American government and will differentiate between statements of fact and statements of opinion.

Level Five - Synthesis

Synthesis is somewhat the opposite of analysis. Analysis, you will recall, involves the breaking down of a communication into parts. Synthesis is the putting together of elements to create a whole. The key word in the last statement is "create" for synthesis is commonly seen as a form of self-expression in which the individual is expected to produce something different and creative ---a mark of his individuality. Usually, however, this is not completely free expression since the student is often expected to work within the limits set by a particular problem or a particular set of materials.

Synthesis can be compared to the category of divergent thinking as defined by Gallagher in his publication, Productive Thinking. Divergent thinking also requires the pupil to organize

elements into new, creative patterns. It is to be expected that the child will be original or imaginative in his response; hence, it is often unlikely that the teacher can set in advance a right answer to the situation or problem.

Synthesis is also composed of three sub-categories according to Bloom's Taxonomy.

1. Production of a unique communication--writing an essay or story, preparing a poem, etc.
2. Production of a plan or proposed set of operations--setting up a social studies experiment, preparing an individual plan for the study of a body of information, etc.
3. Production of a set of abstract relations--making a hypothesis, developing a conceptual model. (What you did in the terminal activity of Module #1 can be categorized as synthesis--production of a set of abstract relations.)

To summarize:

Perhaps the main difference between these categories (comprehension, application, and analysis) and synthesis lies in the possibility that they involve working with a given act of materials or elements which constitute a whole in itself. They involve studying a whole in order to understand it better. In synthesis, on the other hand, the student must draw upon elements from many sources and put these together in a structure or pattern not clearly there before. [Writer's note: Not clearly there before in the eyes of the student. The structure of pattern may have been identified by others but not, as of yet, by the individual student involved in synthesis thinking.]

His efforts should yield a product--something that can be observed through one or more of the senses and which is clearly more than the materials he began to work with.[6]

Examples of Synthesis Behavioral Objectives:

1. Given any necessary materials, each pupil will create a project for the local social science fair that depicts a social problem in one of the countries studied prior to that time.
2. After studying a unit on prejudice the student will be given any necessary materials needed to compose a poem or story or to make a poster that reflects his ideas or emotions about prejudice.-

Level Six - Evaluation

Evaluation requires the individual to judge, value, justify a choice, or defend a position. It involves the use of criteria or standards, either determined by himself or others, to determine the extent to which a communication is accurate, effective, etc. Because of this, an evaluation objective calls for not only an individual choice but a reason or justification for that choice.

One feature that is somewhat unique to the evaluation category of the taxonomy, is that evaluation provides a link to the affective behaviors of valuing, liking and enjoying.

[6]Ibid., p. 162.

Often the judgments we make are strongly based on ideas or objects useful or liked by the individual.

> For the most part, the evaluations customarily made by an individual are quick decisions not preceded by very careful consideration of the various aspects of the object, idea, or activity being judged. These might more properly be termed opinions rather than judgments. Customarily, opinions are made at less than a fully conscious level and the individual may not be fully aware of the clues or bases on which he is forming his appraisals. For purposes of classification, only those evaluations which are or can be made with distinct criteria in mind are considered. Such evaluations are highly conscious and ordinarily are based on a relatively adequate comprehension and analysis of the phenomena to be appraised. It is recognized that this may be far from the normal state of affairs. It is, however, based on a recognition that educational procedures are intended to develop the more desirable rather than the more customary types of behaviors.[7]

Examples of Evaluation Behavioral Objectives:

1. After studying about the advantages and disadvantages of living in Rio de Janeiro, Brazil or the Amazon Lowlands, the pupil will decide in which of the two places he would rather live and give reasons to support his choice.
2. During a unit on democracy in which pupils and teacher develop specific criteria for democratic government, the pupil will analyze the workings of his own classroom to assess whether it is an example of democratic government. The pupil will support his decision.

[7] Ibid., p. 186.

You are undoubtedly aware by now of the importance of clear, precise behavioral terms in writing behavioral objectives for it is the behavioral term that denotes what pupils are to do--what kind of thinking they are to exhibit. Examination of the behavioral term of an objective will often be of much help in determining the cognitive level of the objective.

Figure 3 on pages 37 thru 39 depicts the six categories of Bloom's Taxonomy and illustrative action verbs (behavioral terms) for each category. You will notice that some action verbs are listed in more than one category.

In summary, we might use the following definitions of Bloom's categories of thinking presented by Norris Sanders in his book, Classroom Questions--What Kinds.[8]

1. Memory: The student recalls or recognizes information.
2. Comprehension:

   Translation: The student changes information into a different symbolic form or language.

   Interpretation: The student discovers relationships among facts, generalizations, definitions, values and skills.
3. Application: The student solves a life-like problem that requires the identification of the issue and the selection and use of appropriate generalizations and skills.

[8]Norris M. Sanders, Classroom Questions: What Kinds, New York: Harper & Row, 1966.

Examples of General Instructional Objectives and Behavioral Terms for the Cognitive Domain of the Taxonomy

Illustrative General Instructional Objectives	Illustrative Behavioral Terms for Stating Specific Learning Outcomes
Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles	Defines, describes, identifies, labels, lists, matches, names, outlines, reproduces, selects, states
Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal material to mathematical formulas Estimates future consequences implied in data Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
Applies concepts and principles to new situations Applies laws and theories to practical situations Solves mathematical problems Constructs charts and graphs	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses

Illustrative General Instructional Objectives	Illustrative Behavioral Terms for Stating Specific Learning Outcomes
Demonstrates correct usage of a method of procedure	
Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevancy of data Analyzes the organizational structure of a work (art, music, writing)	Breaks down, diagrams, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, points out, relates, selects, separates, subdivides
Writes a well organized theme Gives a well organized speech Writes a creative short story (or poem, or music) Proposes a plan for an experiment Integrates learning from different areas into a plan for solving a problem Formulates a new scheme for classifying objects (or events, or ideas)	Categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes

Illustrative General Instructional Objectives	Illustrative Behavioral Terms for Stating Specific Learning Outcomes
Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work (art, music, writing) by use of internal criteria Judges the value of a work (art, music, writing) by use of external standards of excellence	Appraises, compares, concludes, contrasts, criticizes, describes, discriminates, explains, justifies, interprets, relates, summarizes, supports

Material taken from Normal E. Gronlund, Stating Behavioral Objectives for Classroom Instruction, New York: The Macmillan Company, 1970, pp. 21.

4. Analysis: The student solves a problem in light of conscious knowledge of the parts and forms of thinking.
5. Synthesis: The student solves a problem that requires original, creative thinking.
6. Evaluation: The student makes a judgment of good or bad, right or wrong, according to standards he designates.

Activity 3

Read and study each of the behavioral objectives listed below. Write the cognitive level (using Bloom's Taxonomy) of each objective in the provided spaces.

_____ 1. Having previously been given instruction on the use of an index, the pupil will use the indices of several reference sources when collecting information for a written report.

_____ 2. Given a paper and pencil, the pupil, after studying the Westward Movement, will write a story entitled, "Life as an Early Settler in the West."

_____ 3. Following a unit of study based on the generalization, "Climate affects the kind of shelter built by people," the pupil will state the generalization in his own words.

_____ 4. Given a newspaper article, the pupil will identify the writer's main point and will identify data in the article that supports that main idea.

_____ 5. Given a list of words encountered during the social studies unit, the pupil will be able to pronounce each word correctly.

_____ 6. Given two sources of information, the pupil will choose the better source using criteria of accuracy and comprehensiveness. He will verbally justify his choice.

_____ 7. Given experiences in taking turns in the classroom under controlled conditions, the pupil will take turns in games on the playground without the teacher's direction.

_____ 8. Given a set of data in verbal form, the pupil will convert the information into a bar graph.

_____ 9. Given three alternatives to solving a problem, the pupil will select the alternative that results in "most good for the most people" and support his selection.

_____10. After a unit of study on "Our Community," pupils will make a cassette tape about their specific city to send to their pen-pal classroom in England.

Activity 4

Oftentimes the cognitive level of thinking that you can reasonably expect from pupils is dependent on the social studies content they are utilizing or the type of experiences or activities they are provided.

Found below are selections of content taken from the fourth-grade textbook, Web of the World: Interdependence of People and Places (Macmillan Company, 1971). Write a behavioral objective at the requested level for each of the content selections. (This does not, however, signify that these selections of content could be used only for the cognitive levels suggested.)

Content Selection #1

We must learn two more new words. Some of what we want or need are things. We can see and touch things. Groceries, an automobile, a toy are things, These are called "goods."

We also want many "services." Suppose you buy a movie ticket. This "thing"--ticket--is not what you want. You want entertainment. The ticket bought it. It bought you many "services." Someone made the movie for you. The actors acted for you. Someone showed the film.

There are many other kinds of services. We take a ride in a taxi. We have bought the services of the driver. Can you think of services your family receives? The boy who delivers your newspaper is doing a service. The plumber

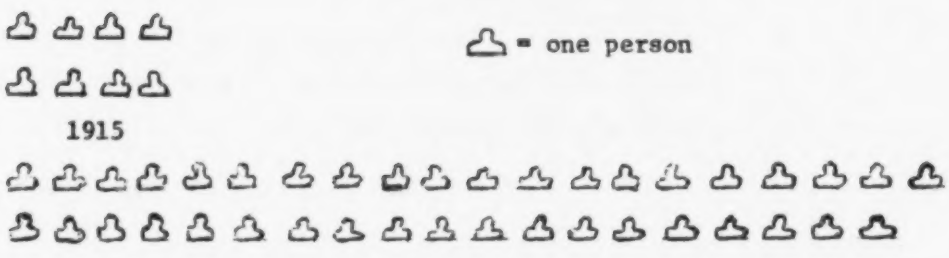
gives service. Your television set breaks. You buy service. The milkman provides the service of delivering milk. Perhaps you live in an apartment. Your rent buys the janitor's services.

We depend on other services. Who fixes the roads? Who cleans the sidewalks? Who takes away the garbage? Who delivers the mail? People who serve us. Soldiers protect our country. This is a service. Doctors heal. Teachers teach. These are services.

Knowledge Behavior Objective:

Content Selection #2

People Fed by One Farmer's Work



Comprehension Behavioral Objective:

Content Selection #3

In the pupil's book the section, "Another kind of division of labor" the automobile assembly line is illustrated. The teacher's manual for this section suggests:

- This learning experience might be an interesting follow-up to the discussion of complex division of labor.

- Children can suggest five or six products they they are reasonably certain are made on an assembly line--anything from toys to radios to automobiles.

- Meeting in small groups, they should discuss the steps that would probably be taken by several workers in assembling the item. After a few minutes of this discussion, children within each group may choose to be workers on the assembly line. They should agree on an order or presentation and then, with the entire class rejoined, each should explain the particular operation that he performs as a worker manufacturing his group's item. If a group is willing to perform a bit, each can act out his job.

Application Behavioral Objective:

Content Selection #4

The Efficient Reader

notes words, phrases, and sentences that show the authors' point of view .

Authors often signal to their readers that they are about to express opinions by writing phrases such as "It seems to me that . . .", "In my opinion. . ." But often they do not give such signals. The reader must be on the alert to the difference between fact words and fact statements and opinion words and statements.

1. What sentence in the first paragraph of this chapter expresses an opinion?
2. Once you have noted this opinion of the authors', you know what standard they will use in deciding what is "good" and "bad" about cities. What standard is it?
3. Pictures can express opinions too. When the authors chose the pictures on pages 218 and 219, what opinion about pollution did they want to get across to you?
4. In the first paragraph on page 220, what word do the authors use to get across a feeling of how bad some city housing is?
5. What opinions are expressed in the paragraph on page 221 beginning "In almost every. . . ."?
6. The paragraph on page 227 beginning "Some people want. . ." talks about suburbs. Can you tell whether the authors think suburbs are good or bad places to live?
7. Look on page 231 at the two sentences that begin "None of this. . ." "It happens because. . ." Why did the authors include these ideas at the end of the chapter?

(The pages listed above are pages found in the unit of the textbook that the pupils would begin studying next.)

Analysis Behavioral Objective:

Content Selection #5

In the textbook (page xviii) the children have learned how to interpret material in the form of graphs. The Teacher's Manual (page 3) suggests:

> As a follow-up, your pupils might wish to make a pie-graph presenting some data with which they are familiar or some data that they make up, such as:
>
> How I spend the day.
> How Robert spends his allowance.

Synthesis Behavioral Objective:

Content Selection #6

Which two of the four ways listed below are poor ways to store value? Why are the other two ways better?

a. Buying a horse

b. Buying hundreds of ladies' dresses

c. Buying silver and gold bars

d. Buying carloads of fresh oranges.

(In the unit pupils studied various ways of storing value, but assume that these are four new examples.)

Evaluation Behavioral Objective:

PART III. MATCHING COGNITIVE LEVEL OF OBJECTIVES AND TEACHER QUESTIONS

Once a teacher has written behavioral objectives for a lesson, the next step is to specify to pupils what they are to do (the kind of thinking behavior needed) to demonstrate competence on the objectives. One simple way of doing this would be to make the behavioral objectives public, that is, to write the behavioral objective on the board. This tactic is seldom used. Usually the teacher "tells" pupils what is expected of them by the questions asked, the directions given, or the activities provided. Most often, the teacher's questions are the pupils' key to what is expected of them.

After the teacher has decided the thinking behavior he wants pupils to exhibit he must then formulate clear, concise questions, directions, and activities that explain to the students exactly what is expected of them. The critical issue is what the student <u>believes</u> he is expected to do in order to answer the question, follow the directions, etc., correctly, i.e., "Am I to recall? Am I to interpret? Am I to judge or evaluate?"

In translating objectives into teacher questions, one must remember to match the cognitive level of the two. For example, if the teacher objective states that pupils are to evaluate a set of data, he would not get his objective across to children by asking a question or set of questions that asked them to recall or restate the data. He should

ask a question that makes children think that he expects them to evaluate or a sequence of questions that eventually works them up to the mental process of evaluation. If he expects them to recall information, he would not ask an evaluation question.

Bloom's Taxonomy has also been used frequently to analyze the cognitive level of teachers' questions. Sample questions at each of the six cognitive levels are presented in Figure 4.

In formulating clear, concise questions for pupils the wording of the questions is critical because it sets the criteria for the cognitive level and the number of responses expected. Cunningham has identified four common wording problems that should be avoided.

1. "Yes" or "No" questions.
2. Ambiguous questions.
3. "Spoon-feeding" questions.
4. Confusing questions. [1]

Problem Type One: "Yes" or "No" Questions

These are questions that demand a "yes" or "no" answer.

Example: Does all communication have to be spoken?

In this case the pupil can satisfy the criteria established by the wording with a simple yes or no response. The pupil may well respond correctly by guessing. To compensate the teacher may follow with another question, "Why?" In this case, asking

[1]Roger T. Cunningham, "Developing Question-Asking Skills," in Developing Teacher Competencies, edited by James E. Weigand, Prentice-Hall, Inc. 1971. pp. 107-117.

FIGURE 4

CLASSROOM QUESTION CLASSIFICATION

Category Name	Sample Phrases and Questions
1. Knowledge	1. "What did the book say about...? 2. "Define...." 3. "List the three..." 4. "Who invented...."
2. Comprehension	1. "Explain the...." 2. "What can you conclude ..?" 3. "State in your own words...." 4. "What does the picture mean?" 5. "If it rains, then what...?" 6. "What reasons or evidence...?"
3. Application	1. "If you know A and B, how could you determine C?" 2. "What other possible reasons...?" 3. "What might they do with...?" 4. "What do you suppose would happen if...?"
4. Analysis	1. "What was the author's purpose, bias, or prejudice?" 2. "What must you know for that to be true?" 3. "Does that follow?" 4. "Which are facts and which are opinions?"
5. Synthesis	1 "If no one else knew, how could you find out?" 2. "Can you develop a new way?" 3. "Make up...." 4. "What would you do if...?"

C. Evaluation	1	"Which policy will result in the greatest good for the greatest number?"
	2.	"For what reason would you favor...?"
	3.	"Which of the books would you consider of greater value?"
	4.	"Evaluate that idea in terms of cost and community acceptance "

Adapted from Gary Manson and Ambrose A. Clegg, Jr. "Classroom Questions: Keys to Children's Thinking," Peabody Journal of Education, March, 1970, pp. 304-305.

two questions is not an economical use of teacher or pupil time. Then, too, neither of the two questions is very clear. The intent of the questions would have been clearer had they been rephrased and combined to "What are some forms of communication other than spoken communication?" or "How can we communicate in ways other than speaking?" The purpose of the question is now clearer and pupils have a better idea of what thinking is expected of them.

Problem Type Two: Ambiguous Questions

Ambiguous questions are questions that lack adequate criteria for the pupil to compose a meaningful response. They are vague, unclear, and provide no guidance to the pupil. Often they provide the opportunity for pupils to ramble on and on with their answers, never really answering what the teacher may expect.

Example: What about division of labor?
Tell me about the cotton gin.
Discuss prejudice.

Problem Type Three: "Spoon-Feeding Questions"

These are questions that give <u>too much</u> guidance for a response; often to the point that the answer is so obvious the question is hardly worth the time it takes to answer it.

Examples are questions that are leading, "So we can say that Denver is the capital city of Colorado, right? or questions that include the answer, "Is the capital city of Colorado Denver or Colorado Springs?"

Problem Type Four: Confusing Questions

These might be thought of as questions that include too many factors for the pupil to consider at one time. If all the factors are difficult to remember, the pupil may well be confused by the time the teacher finishes stating the question.

Example: How, when and where did the Civil War begin and what were the reasons for it?

The solution to rephrasing confusing questions is to ask them as separate questions with one main idea in each question.

Yes, the wording of a question is critical to its success. In summary:

> A question that is properly structured will contribute to a clear understanding, serve as a model to pupils, and insure accurate communication of the the question's purpose. When properly phrased, a question will employ clear wording, contain vocabulary suited to the group with which it is used, employ wording appropriate to the level of thinking sought in the question [emphasis mine] and possess content relevant to the purpose of the question.[2]

[2] Cunningham, op. cit., p. 113.

Activity 5

The questions given below illustrate some of the wording problems described above. Rewrite each question to eliminate any such problems.

1. What about environmental problems?

2. Is Brazil larger or smaller than the Soviet Union?

3. Can you say that New York City is a very important metropolitan area?

4. What are the major farming, fishing, mineral and manufacturing areasof the United States?

Activity 6

Demonstrate that you are able to write clearly worded questions to accompany behavioral objectives written at various levels of Bloom's Taxonomy by composing a teacher question that meets the criteria presented in Part III of this module for each of the behavioral objectives listed in Activity 3 on pages 40 and 41.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

TERMINAL ACTIVITY

Successful completion of the following activity will demonstrate that you have obtained the competencies needed to illustrate mastery of terminal objective #1 listed on page 3 of this module. Proficiency of terminal objective #2 on page 3 will be developed and evaluated in the module on evaluation (the last module of the course). To be prepared to complete terminal objective #2 late in the course, you should now obtain an audio tape. Use this tape to audio record one of the social studies lessons that you will later teach in your field center classroom. (It is recommended that you tape either the data interpretation lesson or the valuing lesson.) Save this audio recording for analysis in the evaluation module.

Using the selection of content presented below, "The Mustangs' Last Stand," as the information to serve as the basis of a social studies lesson, you are to:

1. Write behavioral objectives for the lesson that reflect at least four different levels of Bloom's Taxonomy.
2. Write a pivotal teacher question for each of the behavioral objectives that clearly designates to pupils the kinds of thinking expected of them.

Use the form on the last page of this module to complete this activity. Return the completed form to your instructor to determine if you have successfully demonstrated the desired terminal objectives of this module.

A reading has been omitted here because of copyright restrictions. It is, "The Mustangs' Last Stand," Post Printing & Publ. Co., Denver 2, Colorado (The Denver Post, November 10, 1957)

MODULE #2 TERMINAL ACTIVITY FORM

Student:

Date:

Behavioral Objectives	Pivotal Teacher Questions
1. (Knowledge)	
2. (Comprehension)	
3. (Application)	
4. (Analysis)	
5. (Synthesis)	
6. (Evaluation)	

EVALUATION FORM FOR SELF-INSTRUCTIONAL MODULES

Name _____ Date _____

Instructor _____ Course _____

Module Title _____

1. Approximately how many hours did it take you to complete this module _____.

2. Please check one square under each category (Usefulness & Difficulty) per row.

	Usefulness			Difficulty		
	Not Useful	Useful	Very Useful	Too Difficult	Too Easy	Just Right
1. Introduction						
2. Module objectives						
3. Explanations & Definitions						
4. Examples - Illustrations						
5. Directions						
6. Activities						

3. What should be added or deleted to improve this module? (Comment)

4. What degree of competence do you feel you now possess in understanding and being able to model (chart) a body of information?

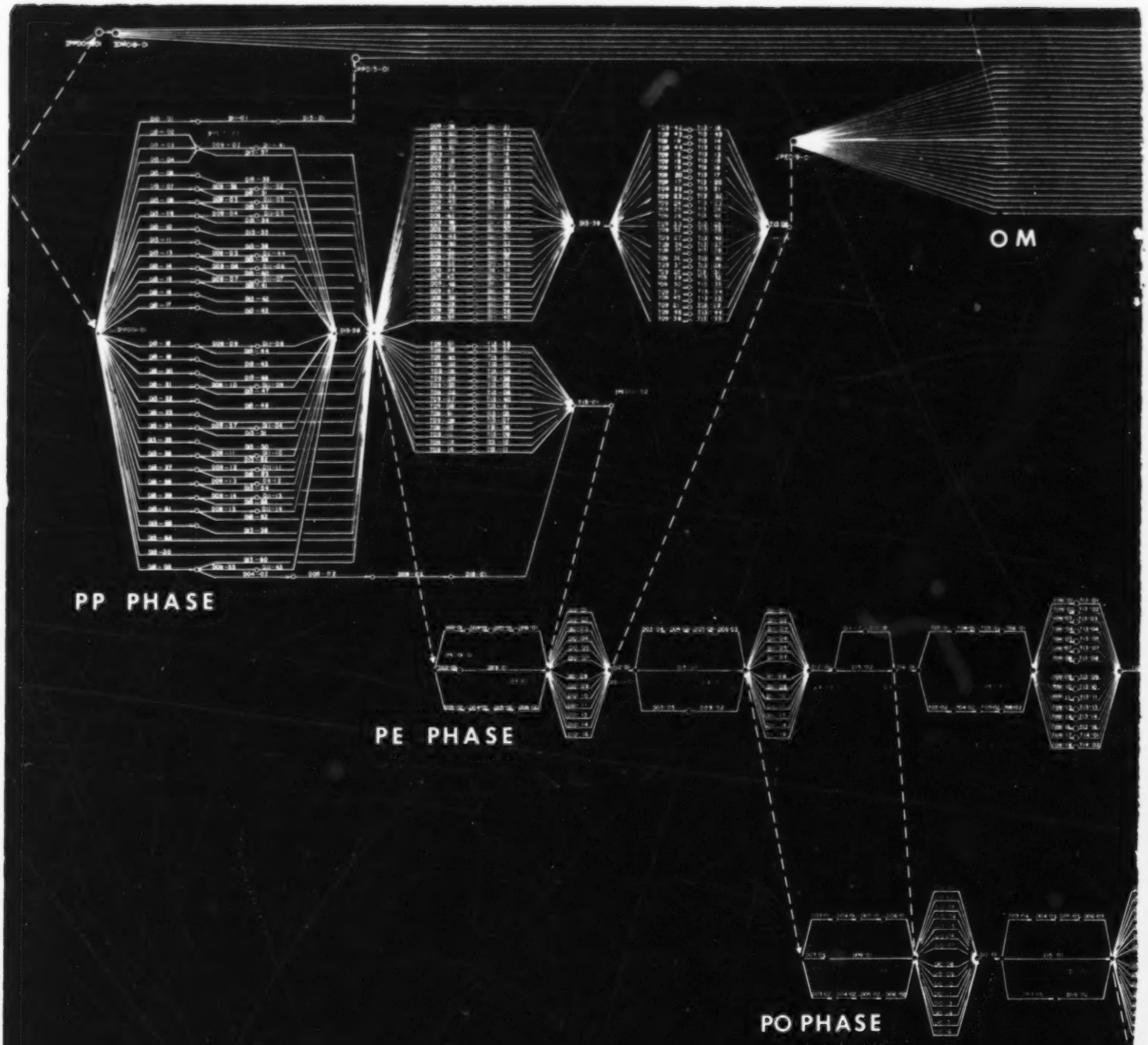
_____ Very Competent

_____ Marginally Competent (I feel I can do this but I think I may need more practice)

_____ Not Competent (I feel that I'm not able to do this.)

5. Have you completed modules for any other methods course at the University of Georgia? If so, list the courses below.

If you have completed modules in other courses, how would you rate this module in comparison to the others? (Comment)


OM
PP PHASE
PE PHASE
PO PHASE